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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket No. 26.2.965/USA

In re Application of:	)
Steve A. Sallstrom et al.	)
Serial No. 08/192,022	)
Filed February 3, 1994	) Group Art Unit ~~3106~~
For ALL WHEEL HYDRAULIC DRIVE SYSTEM	) Examiner

INFORMATION DISCLOSURE STATEMENT

The Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98, the Applicants wish to bring the prior art references listed on the attached Form PTO-1449 to the attention of the Patent and Trademark Office.

A concise explanation of the relevance of some of the references is additionally provided as follows:

U.S. Patent 2,942,677 to Gray discloses a three wheel tractor having two rear wheels 47 and a single, steerable front wheel 23. Note the hydraulic fluid supply system shown in Fig. 7 which discloses separate hydraulic motors 25, 40 and 40 for driving the wheels with such motors being connected all in parallel to the hydraulic fluid source 56.

U.S. Patent 3,712,404 to Walquist discloses a three wheel tractor having two front wheels 12 and a single, steerable rear wheel 11. Note the hydraulic fluid supply system shown in Fig. 16 which discloses separate hydraulic motors 159, 160 and 163 for driving the wheels with such motors being connected all in parallel to the hydraulic fluid source. See also Col. 10 of Walquist, Lines 26-34.

U.S. Patent 4,157,125 to Bushell discloses a three wheel vehicle having two front wheels 13 and 14 and a single, steerable rear wheel 15. Note the hydraulic fluid supply system shown in Fig. 3 which discloses separate hydraulic motors 13', 14' and 15' for driving the wheels. Hydraulic flow to the rear wheel motor 15' is separate from the parallel circuit supplying flow to the front wheel motors 13' and 14'. In some turns, a valve 21 bridges the separate circuit to the rear wheel motor 15' to then effectively create a parallel connection to all three wheel motors.

U.S. Patent 4,369,855 to Buschbom discloses a three wheel vehicle having two front wheels 12 and 13 and a single, steerable rear wheel 14. Note the hydraulic fluid supply system shown in Fig. 5. Separate hydraulic motors 26 and 27 for driving the front wheels 12 are connected in parallel to a first pump 57. A separate hydraulic motor 73 for the rear wheel 14 receives fluid from a separate second pump 58. A control device 83 automatically attempts to balance the pressure to the rear wheel supplied by the second pump so that all the wheels are driven at the same torque and speed. If one or more of the front wheels starts to slip, this would normally reduce the flow to the rear wheel as well. Thus, the operator can manually override

this control function to allow the second pump 58 to supply hydraulic fluid to the rear wheel motor 73 in a greater amount than would otherwise be permitted by control device 83. See Col. 5, Line 66 - Col. 6, Line 10 of Buschbom.

U.S. Patent 4,606,428 to Giere discloses a hydrostatic transaxle assembly for using hydraulic fluid from a pump to drive left and right axle shafts 21 and 23 with a differential action.

U.S. Patent 4,986,387 to Thompson et al. discloses a three wheel forklift truck having two front wheels 21 and 22 and a single, steerable rear wheel 23. Note the hydraulic fluid supply system shown in Fig. 5 which discloses separate hydraulic motors 31, 32 and 33 for driving the wheels. The motors are connected in parallel to the hydraulic fluid source 25. Drive to the rear wheel motor 33 is selectively disengageable through valve 30a to convert to two wheel drive.

U.S. Patent 5,199,525 to Schueler discloses a three wheel vehicle having two front wheels 14 and a single, steerable rear wheel 18. Separate hydraulic motors 12 drive the front wheels 14 and a separate hydraulic motor 16 drives the rear wheel 18. The motors are connected in parallel to the hydraulic fluid source 24. See, for example, Fig. 2A. However, if a wheel loses traction, this is sensed by a sensor and flow to the motor for that wheel is smoothly shut off. Fig. 2A shows flow to the rear wheel motor 16 having been disconnected by control circuit 16.

Toro Greensmaster 3100 Brochure discloses a greens mower manufactured and sold by The Toro Company prior to

this invention. This product is described more fully in the Background of the Invention section of this patent application. Note the "Traction Drive" box shown in the specification list for the Greensmaster 3100 Prime Mover describing use of "front wheel orbit motors" for driving the two front wheels of this product.

Toro Reelmaster 216 Brochure discloses a conventional riding mower manufactured and sold by The Toro Company prior to this invention. This product is described more fully in the Background of the Invention section of this patent application. Note the "Traction Drive" box shown in the Reelmaster 216 Specification list describing the two wheel and three wheel drives offered for this product. In the three wheel drive version, each wheel is operated by its own separate wheel motor with all three wheel motors being connected in parallel to the hydraulic fluid source.

Toro Reelmaster 3500-D Brochure discloses a conventional riding mower sold by The Toro Company prior to this invention. This product includes four wheels, two front wheels and two rear wheels, all of which are driven in this four wheel drive product. A front wheel motor drives the two front wheels through a hydrostatic transaxle providing a differential action between the front wheels, and a rear wheel motor drives the two rear wheels through a hydrostatic transaxle providing a differential action between the two rear wheels. THE FRONT AND REAR WHEEL MOTORS ARE CONNECTED TOGETHER IN SERIES RELATIVE TO THE HYDRAULIC PUMP. In addition, the output shaft of the rear wheel motor is connected by an overrunning clutch to the input shaft of the rear wheel transaxle to allow the rear wheels to overrun when necessary the rotational output of

the rear wheel motor. Note the "4 Wheel Drive System" box shown in the Reelmaster 3500-D, 4-WD Specification list describing this drive system.

The publication dates for the above-noted Toro brochures may not be early enough to establish that these particular brochures are prior art to this invention. However, the brochures are not being submitted as prior art printed publications, but to simply illustrate various products that Applicants admit are prior art to this invention. In view of this admission, the products shown in these brochures should be fully considered by the Examiner, and such consideration should be noted by appropriately checking these brochures on the attached Form PTO-1449.

Enclosed herewith are copies of all of the references cited on the attached Form PTO-1449.

The summaries of the references provided herein are for the Examiner's convenience only. The Examiner should also thoroughly review each reference to independently determine its relevance. It is believed that the claims of this application are allowable over the cited prior art.

Respectfully submitted,

May 4, 1994

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Certificate under 37 C.F.R. 1.8. I hereby certify that this INFORMATION DISCLOSURE STATEMENT and all papers described in or accompanying this document are being deposited with the U.S. Postal Service, as First Class Mail, in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on May 4, 1994.

James W. Weller